Since 1990, The Spaulding Group has had an increasing presence in the money management industry. Unlike most consulting firms that support a variety of industries, our focus is on the money management industry.

Our involvement with the industry isn't limited to consulting. We're actively involved as members of the CFA Institute (formerly AIMR), the New York Society of Security Analysts (NYSSA), and other industry groups. Our president and founder regularly speaks at and/or chairs industry conferences and is a frequent author and source of information to various industry publications.

Our clients appreciate our industry focus. We understand their business, their needs, and the opportunities to make them more efficient and competitive.

For additional information about The Spaulding Group and our services, please visit our web site or contact Chris Spaulding at

CSpaulding@SpauldingGrp.com

http://www.SpauldingGrp.com

WHOSE RATIO IS IT?

I'm in the process of writing a paper on risk-adjusted return measures for one of my classes and my research is uncovering some interesting novelties about these measures. Let's begin with a quiz. Fill in the blanks: who developed these risk-adjusted return measures?

1. Sharpe ratio _____

2. Treynor ratio _____

3. Sortino ratio_____

Ready for the answers?

The Sharpe ratio[1] was developed by Bill Sharpe and first appeared in his 1966 article, "Mutual Fund Performance," which was published in the *Journal of Business*. There is some confusion, however about this formula, specifically "how to calculate it." We know that other measures (e.g., information ratio) are different versions of the model, but the Sharpe ratio itself is done at least a couple different ways.

The way it was originally defined:

$$SharpeRatio_{Original} = \frac{\overline{R}_p - \overline{R}_f}{\sigma R_p}$$

where
$\overline{R}_p$ = average portfolio return
$\overline{R}_f$ = average risk-free rate of return
R_p = portfolio return

An alternative formula is:

$$SharpeRatio_{Alternative} = \frac{\overline{R}_p - \overline{R}_f}{\sigma (R_p - R_f)}$$

Most of the sources I'm using for my paper reference the first formula; one author states that the first version is "arguably more widely used."[2]

---

1 Sharpe didn't actually call it the "Sharpe ratio." Rather, he called it the reward-to-variability ratio." In a Fall 1994 article in the *Journal of Portfolio Management* ("The Sharpe Ratio"), Sharpe credits others for naming it after him. "Bowing to increasingly common usage," he, too, adopted this label.

2 Opdyke, John Douglas. "Comparing Sharpe ratios: So where are the p-values?" *Journal of Asset Management*. Vol 8, 5, 308-336.

The Journal of Performance Measurement®:

In pursuing this further I discovered that Morningstar uses the second version.[3] Also, Wikipedia's website uses this approach, stating that it's a "revision" from Sharpe's 1994 article. In my reading of this article I see the revision as being like the information ratio (although Sharpe calls it the "ex post Sharpe Ratio") (see page 50).

Which is more commonly used? It's unclear. We'd love to hear your thoughts.

The <u>Treynor ratio</u> was, of course, developed by Jack Treynor. Well, actually, NO! In fact, Jack seems to dislike the formula. In a recent e-mail to me he wrote:

A fund's market risk reflects the kind of stocks it owns. Its non-market risk reflects how hard it trades these stocks—how much it buys and sells, hence the size of its active positions. Reward-to-risk ratios are useful for relating the manager's contribution to return to his non-market risk. Alas, beta—which merely reflects the kind of stocks he owns—is the wrong measure for such a ratio, because it reflects market, rather than non-market risk.

Consider a mutual fund manager who doubles the size of each buy, without any change in the absolute value of his fund; his subsequent sells will also be twice as large. His buys will stay in the portfolio half as long. But if the stale buys are really contributing to his diversification rather than his alpha, then the alpha from his buys will still be realized before the earlier sale. (Maybe he's an information trader rather than a value trader.)

But what about his beta? He owns the same kind of stocks as before, only half as many. So their average beta is the same as before. But, barring an increase in transactions cost, his alpha has doubled. By the simple expedient of doubling his transactions volume, the fund manager has doubled his Treynor ratio.

Now you see why
1) it is popular with Wall Street
2) it doesn't appear in my HBR piece

Okay, and so who developed it if not Jack? He suggested I contact Will Goetzmann at Yale, which I did. Will said that he knew that Jack disavowed responsibility for coming up with the ratio but didn't know who did, but suggested perhaps Bill Sharpe.

In reading Sharpe's 1966 paper[4] I saw that he referenced (a) Treynor's measure and (b) referenced the *HBR* article. However, I see no reference to beta as the risk measure. But, he uses the term "volatility" in such a way that implies (I think) beta (see page 127 of the article). I've reached out to Bill to find out his position on this but so far haven't heard.

Business SourcePremier shows that Treynor's *HBR* article has been cited 130 times in their database. The earliest listed is Bower, Richard S. and J. Peter Williamson, "Measuring Pension Fund Performance: Another Comment" *Financial Analysts Journal*, May/June 1966. It actually appeared after Sharpe's 1966 article and, in fact, references Sharpe's

---

3 If you go to their website and get to data definitions you'll find the following for the Sharpe Ratio: "Our Sharpe ratio is based on a risk-adjusted measure developed by Nobel Laureate William Sharpe. It is calculated using standard deviation and excess return to determine reward per unit of risk. First, the average monthly return of the 90-day Treasury bill (over a 36-month period) is subtracted from the fund's average monthly return. The difference in total return represents the fund's excess return beyond that of the 90-day Treasury bill, a risk-free investment. An arithmetic annualized excess return is then calculated by multiplying this monthly return by 12. To show a relationship between excess return and risk, this number is then divided by the standard deviation of the fund's annualized excess returns. The higher the Sharpe ratio, the better the fund's historical risk-adjusted performance."

4 "Mutual Fund Performance." *Journal of Business*. January, 1966, p. 119-138.

article, too! And, in citing these two articles the authors write "One disadvantage of both Compound Rate of Return and Average Return for comparative evaluation is that neither reflects risk. This advantage does not seem serious and it can be remedied. The remedy, which has been given by a rationale by both Jack L. Treynor and William F. Sharpe, could be to divide each return measure, minus the risk free interest rate, by the standard deviation of yearly returns." (Pages 145-147) Interesting that they credit both with the same approach but neither with the use of beta.

Since we know Jack Treynor neither came up with the measure nor apparently likes it, it would be nice to know who did originate it.

Finally, we have the Sortino ratio. Who developed it? Brian Rom, of course (that's obvious, isn't it?). While Brian wasn't able to point to an article he wrote, he stated (again, in an e-mail to me) that he developed the ratio and told Frank that he wanted to name it after him. If you visit Frank's website you'll find a reference to this (http://www.sortino.com/htm/Sortino%20Ratio.htm). Frank states "I would like to make it clear that it was not my idea to call this the Sortino ratio. It was Brian Rom's idea at Investment Technologies. This came out of research I did in the early 80's. The first reference was in the Financial Executive Magazine, August 1980. The first calculation was in the *Journal of Risk Management*, September 1981." Wikipedia, too, states that "The ratio was created by Brian M. Rom."

Confused? I am, too!

ANNUALIZING STANDARD DEVIATIONS

A not-uncommon practice is to annualize monthly standard deviations. I've concluded that this is not a good idea for a number of reasons. In an e-mail to me, Bruce Feibel wrote "If you use monthly returns to calculate standard deviation, your results will be monthly standard deviations. That is, you can evaluate dispersion around the average monthly return using the monthly standard deviation. But returns are often evaluated on an annual basis. Just like we scale up returns to an annual basis, there are statistical techniques for scaling up standard deviation. The method of conversion is sometimes called the square root of time rule. That is, you multiply the standard deviation by the square root of the number of annual periods. To scale from monthly to annual, multiply standard deviation by the square root of 12. It is very important to note that there are assumptions underlying this scaling: the square root of time rule is not always true. For example, the standard deviation of monthly returns scaled to an annual equivalent may over- or under-state annual standard deviation calculated using daily returns. The rule also assumes that periodic returns are not serially correlated. There are other methods of scaling standard deviation where serial correlation is present."

I informed Steve Campisi of my recently-arrived-at position of opposing this practice and he responded "I agree completely. Further, one must agree because what you say is implicitly true. You are demonstrating that time series dependency is a significant problem when trying to draw a generalized inference. Essentially, this is a problem with sampling error."

I will address this topic in greater detail in August as well as in a forthcoming article.

FROM OUR READERS

Andre Mirabelli sent us a note some time ago regarding our March issue and we failed to include it in a timely manner. Our apologies to Andre for our tardiness. Here are his thoughts:

As usual, I always find your Performance Perspectives worth pondering.

This time I was struck by the comment, in the recent March 2008 issue, that "Modified Dietz's error increases as cash flows grow larger."

As a counter example, consider a portfolio that does great. It triples its value in each of two consecutive and equal duration time periods (W = 1/2), so the performance is 200% and 200% for a combined 800%. We withdraw money between the periods and still the portfolio ends up with more than we started.

In the first new case we have a cash flow of -55%, withdrawing 55% of the value existing at the end of the first period. In the second new case we have a cash flow of -70%, withdrawing 70% of the value existing at the end of the first period. In the third new case we have a cash flow of -85%, withdrawing 85% of the value existing at the end of the first period. Calculating the error created by the Modified Dietz approach, as you did, shows that it is the middle size cash flow that has the largest error. Thus, it is not always the case that the "Modified Dietz's error increases as cash flows grow larger." This conclusion holds whether absolute values of the error are taken or not and whether more negative cash flows are considered larger or smaller.

Note that in the last two cases I consider, the Modified Dietz approach assigns very negative returns to these hugely positive results. Thus, it is an extremely bad approximation.

As you state, "Modified Dietz is only an approximation" and "we are only willing to accept a certain degree of error" and that "problems…can occur with Modified Dietz when there are large flows, especially in volatile markets." These new examples show that the situation is even worse than your note indicates in that the error is not even an increasing function of the cash flows. In situations like the ones here considered, such blatant anomalies can be created whenever the product of the Modified Dietz weighting factor and the first period return factor is greater than one (W*[1+R1] >1).

This is only one indication of why I have found it necessary to develop for my own work a more viable approach to performance measurement then Modified Dietz and its many similarly problematic variations. In a related matter, I eagerly look forward to comparing the conclusions of your IRR Standards Working Group to those I have developed on that topic.

PERFORMANCEJOBS.COM WEBSITE

If you have two to five years experience and are looking for career advancing opportunities submit your resumes to PerformanceJobs.com.

We're pleased to announce that our new website is now available for PerformanceJobs.com. Take a visit and you'll also see that we already have jobs posted. We're very excited with the initial interest this new venture has caused and look forward to it becoming the major resource for individuals seeking employment as well as firms looking to hire. If you know of someone who is looking for a career in investment performance, please direct them to our site and encourage them to submit their resume today.

PERFORMANCEJOBS.COM

THE SPAULDING GROUP'S 2008 INVESTMENT PERFORMANCE MEASUREMENT CALENDAR OF EVENTS

DATE	EVENT	LOCATION
August 25-26	CIPM Principles Prep Class	New Brunswick, NJ (USA)
August 27-29	CIPM Expert Prep Class	New Brunswick, NJ (USA)
September 22-23	Introduction to Performance Measurement Training	Boston, MA (USA)
October 7-8	Introduction to Performance Measurement Training	New York, NY (USA)
October 9-10	Performance Measurement Attribution Training	New York, NY (USA)
October 7-8	Introduction to Performance Measurement Training	San Francisco, CA (USA)
October 9-10	Performance Measurement Attribution Training	San Francisco, CA (USA)
October 21-22	Introduction to Performance Measurement Training	Chicago, IL (USA)
October 23-44	Performance Measurement Attribution Training	Chicago, IL (USA)
November 13-14	Performance Measurement Forum (Europe)	Amsterdam, The Netherlands
November 19	Trends in Attribution Symposium (TIA)	Philadelphia, PA (USA)
December 4-5	Performance Measurement Forum (North America)	Orlando, FL (USA)
December 9-10	Introduction to Performance Measurement Training	New Brunswick, NJ (USA)
December 11-12	Performance Measurement Attribution Training	New Brunswick, NJ (USA)

For additional information on any of our 2008 events,
please contact Christopher Spaulding at 732-873-5700

Save the Date!

The Journal of Performance Measurement ®
Second Annual International

TIA
Trends In Attribution
SYMPOSIUM
November 19, 2008

TRAINING...

Gain the Critical Knowledge Needed for Performance Measurement and Performance Attribution

TO REGISTER:

Phone: 1-732-873-5700

Fax: 1-732-873-3997

E-mail: info@SpauldingGrp.com

The Spaulding Group, Inc. is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit. Complaints regarding registered sponsors may be addressed to the National Registry of CPE Sponsors, 150 Fourth Avenue North, Suite 700, Nashville, TN 37219-2417. **www.nasba.org**

INTRODUCTION TO PERFORMANCE MEASUREMENT

A unique introduction to Performance Measurement specially designed for those individuals who require a solid grounding in all aspects of performance measurement. The Spaulding Group, Inc. invites you to attend Introduction to Performance Measurement on these dates:

September 22-23, 2008 – Boston, MA

October 7-8, 2008 – New York, NY

October 7-8, 2008 – San Francisco, CA

October 21-22, 2008 – Chicago, IL

December 9-10, 2008 – New Brunswick, NJ

15 CPE & 12 PD Credits upon course completion

The Spaulding Group is registered with CFA Institute as an Approved Provider of professional development programs. This program is eligible for 12 PD credit hours as granted by CFA Institute.

PERFORMANCE MEASUREMENT ATTRIBUTION

Two full days devoted to this increasingly important topic. The Spaulding Group, Inc. invites you to attend Performance Measurement Attribution on these dates:

October 9-10, 2008 – New York, NY

October 9-10, 2008 – San Francisco, CA

October 23-24, 2008 – Chicago, IL

December 11-12, 2008 – New Brunswick, NJ

15 CPE & 12 PD Credits upon course completion

The Spaulding Group is registered with CFA Institute as an Approved Provider of professional development programs. This program is eligible for 12 PD credit hours as granted by CFA Institute.

IN-HOUSE TRAINING

The Spaulding Group has offered in-house training to our clients since 1995. Beginning in 1998, we formalized our training, first with our Introduction to Performance Measurement class and later with our Performance Measurement Attribution class. We now also offer training for the CIPM program. To date, over 2,000 individuals have participated in our training programs, with numbers increasing monthly.

We were quite pleased when so many firms asked us to continue to provide in-house training. This saves our clients the cost transporting their staff to our training location and limits their time away from the office. And, because we discount the tuition for in-house training, it saves them even more! We can teach the same class we conduct to the general market, or we can develop a class that's suited specifically to meet your needs.

The two-day introductory class is based on David Spaulding's book, Measuring Investment Performance (McGraw-Hill, 1997). The attribution class draws from David's second book Investment Performance Attribution (McGraw-Hill, 2003). The two-day Advanced Performance Measurement Class combines elements from both classes and expands on them.